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ABSTRACT

Although much of the pedagogical literature suggests otherwise, not all students find case-based instruction interesting and valuable or are confident learning from this method. This exploratory study examined how students responded to case-based instruction by exploring similarities and differences among nine students' experiences in a case-based biochemistry course. Nine first-year veterinary students were interviewed three times during the semester to explore their initial and changing responses to case-based instruction. Patterns of responses which emerged during the analysis revolved around changing levels of motivational challenge, frustration, and perceived relevance and stimulation of the method. Implications for the development and use of case studies in professional education programs are discussed. (Contains 11 references.) (Author/SWC)

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Title:

Students' Responses to Case-Based Instruction: The Role of Perceived Value

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Abstract

Although much of the pedagogical literature suggests otherwise, not all students find case-based instruction interesting and valuable or are confident learning from this method. In this exploratory study, we examined how students responded to case-based instruction by exploring similarities and differences among nine students' experiences in a case-based biochemistry course. Nine first-year veterinary students were interviewed three times during the semester to explore their initial and changing responses to case-based instruction. Two general patterns of responses emerged during our analysis. These patterns revolve around the value that students assigned to case-based instruction and describe the extent to which they felt motivationally challenged or frustrated by the case method. Implications for the development and use of case studies in professional education programs are discussed.

Although case-based instruction has been accepted as an effective teaching method in business and law schools for over a century, very little work has been done which carefully examines how individual learners respond to case-based instruction (Knirk, 1991). The general implication in the literature is that students find cases motivating (e.g., Shulman, 1992), yet a few educators have argued that case-based instruction might not "work" for all learners (e.g., Cossom, 1991). Given the fervor with which case-based instruction is currently being advocated in professional education (Shulman, 1992), it is important to understand how this instructional method affects the persons most directly involved in it. What are students' perceptions of case-based instruction? How interesting and valuable do students find this method; how confident do they feel learning from this approach? What makes this type of learning more or less challenging than other instructional methods?

In general, case-based instruction is a teaching method that requires students to actively participate in real or hypothetical problem situations reflecting the kinds of experiences naturally encountered in the discipline under study. Although there are many varieties in both form and style, case-based instruction tends to support a focus on professional education as a process, not a product. As such, it is believed to develop practitioners who can make sense of problems that are not always straightforward or clear-cut.

It is not unusual for those who advocate the use of case-based instruction to assume that students will be motivated to deepen their understanding when confronted with authentic problems in realistic situations (Blumenfeld, Soloway, Marx, Krajcik, Guzdial, and Palincsar, 1991). Unfortunately, not all students are adequately prepared to direct their own learning in a case-based environment. Cossom (1991) stated that, "Clearly (case-based instruction) is not a teaching/learning method that appeals to all students nor is it one that draws neutral responses" (p. 151). Providing students with opportunities to integrate their knowledge through case studies may not be effective if they lack the skills or motivation needed to regulate their learning. It is important for case instructors to be aware of students' responses to the case method and to provide support for those who are unprepared, intimidated, or reluctant to engage in these unfamiliar learning tasks.

This study departs from traditional summative/evaluative or media/method comparison studies in that it describes case-based instruction from the participants' point of view and describes those aspects that learners found most valuable and/or frustrating about the case method. By examining a variety of students' responses we hoped to identify instructional conditions, learner characteristics, and/or learning strategies that facilitated or limited students' responses to this method. Ultimately our goal was to provide educators with information about how to design/utilize the approach so that benefits of case-based instruction might be maximized for all learners expected to learn from it. Thus, the questions guiding data collection were

(1) How do students respond to case-based instruction? Which aspects do they find interesting, valuable, and worthwhile? Which aspects are difficult or frustrating?
(2) How do students' responses change as they gain experience with the case method? What happens to their interest, value, and confidence for learning from this method during a semester long course? What happens to frustration?

Methods

This study used qualitative methodology to explore the perspectives of a diverse group of veterinary students who were recently introduced to case-based instruction. Semi-structured interviews, conducted with nine first-year students, constituted the primary data source and were supported by additional data gathered from classroom observations, students' written case analyses, informal teacher interviews, and student course evaluations. Qualitative analysis methods were used to search interview data for patterns of responses to case-based instruction. Comparisons were then made across time to assess changes in students' responses over the semester.

The Site

A professional school of veterinary medicine, located at a large midwestern university, is one of only 27, nationwide, that grants the degree of Doctor of Veterinary Medicine (DVM). This particular school follows the traditional model of veterinary education, which according to Turnwald, Bull, and Seeler (1993), "is based on the concept that the primary purpose of education is transmittal of knowledge and skills" (p. 38). Didactic instruction is provided in the areas of anatomy, pathobiology, physiology, and pharmacology, and tends to rely on "fact-laden lectures, assigned readings, drills, quizzes, rote memorization, and examinations" (p. 38). Laboratory experiences are included in the first three years, yet are primarily directed toward transmitting information to the students. In their fourth year, students assume responsibilities of "junior practitioners" in actual clinical and lab settings.

The 4-year program typically limits enrollment to 60 students per class. According to the school catalog, "each prospective student is required to complete a prescribed preprofessional curriculum for two or more collegiate years before admission to the school." Academic performance (e.g., overall GPA, required courses GPA, overall academic performance, and GRE score) accounts for 50% of the admissions criteria, and non-academic activities (interview, work experience, extracurricular activities, veterinary and non-veterinary animal experience, application and essay quality, and references) constitute the other 50%. Due to the equal weight assigned to academic and non-academic criteria, the student population is perceived to be fairly heterogeneous.

The Course

A required freshman course, Systemic Physiology II (Biochemistry), provided the context for this study. The course is described in the syllabus as "an introduction to biomedical principles and their application to veterinary medicine." The lab portion of the course focused on the application of principles learned in lecture to hypothetical patients who mimicked real-life disorders. At the time of the study the same instructor taught two sections of the lab. Although students were assigned to one lab, they typically attended the one that was most convenient during any specific week. Therefore, the number of students in each lab section fluctuated between 15 and 45 students.

Systemic Physiology II was designed so that students received approximately 2 hours of both lab and lecture each week throughout the 16-week semester, yet grades were weighted such that lab performance accounted for only 27% of the total course grade (a common practice in lecture-lab courses reflecting the perceived "density" of their respective information loads). Biochemical case studies were used as the primary instructional method and as an evaluation tool in both lab sections of the course. Grades assigned in lecture were based on 3 objective-type exams; lab grades were based on a term paper, a group case presentation, and an individual case analysis. The case analyses completed during lab meetings were not graded but were designed to give students practice applying biochemistry principles to realistic problems typically encountered in professional practice.

Case study presentations followed a fairly typical pattern. Students were presented with a limited description of an animal in distress. Some of the animal's symptoms were described, accompanied by appropriate illustrations and diagrams, and then students were asked to analyze the patient's condition and to make tentative diagnoses and recommendations for action. As an example, one of the cases is included here:

> Signalment: A German Shepherd dog, castrated male, 7 years of age.
> History: This dog has been a family pet since he was 6 weeks of age. He received a proper series of "puppy shots" and has been vaccinated every year for rabies and DHLPP (Distemper, Hepatitis, Leptospirosis, Parainfluenza, and Parvovirus). He receives heartworm prevention through the spring, summer and fall of each year, and has tested negative for heartworm disease each year. Normally very active, he has been lethargic for the last 7 to 10 days. He doesn't want to run and play like he used to, and he sleeps a lot more. His appetite is decreased a little, and he threw up once last week. The family has noticed that he coughs in the morning when he gets up and coughs after a nap.
> Physical: Weight is 87 pounds, slightly overweight. Heart rate is 190, temperature is 101.4, and respiration is 20. Appears bright, alert, and responsive and is calm. Mucous membranes are more pale than normal, teeth have some tartar, and there is early gingivitis. Ears, eyes, and throat are normal. A lipoma (diagnosed last year) is present over the left thoracic wall. Thoracic auscultation reveals harsh lung sounds, and a grade 3 of 6 murmur is noted in the fifth intercostal space on the left side. Abdominal palpation is normal. Musculoskeletal system is normal except for a slight degree of muscle wasting in the rear legs. Nervous system appears normal.
> Lab results: See the Complete Blood Count, Chemistry Profile, and Urinalysis.

Following a standard veterinary analysis procedure called "SOAP," students analyzed each case by indicating their subjective (S) and objective (O) evaluations of the animal, their assessment (A) of the animal's condition, and their recommended plan (P) for action. This analysis procedure had been introduced during the previous semester but received increased emphasis in the biochemistry lab. Students used this procedure to complete their case analyses throughout the semester yet were encouraged to streamline the process as the semester continued so that it required less time. Students typically worked in groups to complete their SOAPs and were encouraged to ask questions, to check available resources, and to consult with the instructor before making preliminary diagnoses.

All case investigations concluded with a large group discussion in which student recommendations were considered in light of the available lab and clinical data. A final diagnosis was determined after a number of likely diagnoses were identified and rank-ordered from most to least probable. A discussion of the biochemical mechanism(s) of the disease, as well as the effect of recommended treatments on the biochemistry of the disorder, served to link case specifics to basic biochemical principles. Although the teacher indicated why the selected diagnosis was most probable, she continually stressed the need to leave many possibilities open, even those not initially considered to be very likely.

Participants

Students. Sixty-one first-year veterinary students were enrolled in the biochemistry lab during the study. Sixty-six percent of these students were female (n = 38), and ages ranged from 20 to 40 years (M = 24.22, SD = 3.99). Although the majority of students (n = 36) had completed a bachelor's degree, levels of education ranged from two years of post-secondary education (n = 15) to a master's degree. Most students had backgrounds in either biological science or agriculture.

In order to capture a wide range of responses to case-based instruction, interview participants were purposively chosen to represent different ages and genders, and to include a range of educational and work-related experiences. The final interview sample included 7 female and 2 male students ranging in age from 21 - 32 years; in years of related veterinary experience from 0 - 13; in number of previous related courses from 0 - 3; and with GPAs from 2.6 - 4.0. Table 1 presents specific demographic information for the nine interviewees, arranged alphabetically by participants' pseudonyms.

Table 1.

Demographic Information for Interview Participants

Student	Gender	Age	Yrs of school (post HS)	# of previous biochemistry courses	GPA	Related experience
Chrissy	F	22	4	1	3.53	BS-Eng/Chem double major
Deena	F	22	4	2	2.71	BS-Animal Bioscience; Pre-Vet
George	M	21	2	0	2.60	Pre-Vet; swine, cattle experience
Mallory	F	23	4	3	3.61	Pre-Vet; worked in Animal Control
Marci	F	22	3	1	4.00	BS-Biology; worked 4 yrs in small animal clinic
Ronald	M	23	4	0	3.06	BS-Biology; raises snakes
Roslyn	F	32	4	1	2.80	13 yrs in vet clinic; 3.5 yrs in small animal ICU
Sharon	F	24	4	2	2.94	BS-Animal Science; 5 yrs with small animal vet; 2 yrs equine emergency referral service
Winnie	F	26	5	0	2.52	BS-Biology; dressage instructor

The teacher. At the time of the study, Eileen Morrison (a pseudonym) was a 34-year-old practicing veterinarian, as well as a graduate student in the School of Education. Besides working half-time at a small animal clinic, Eileen also had an assistantship that required her to teach the biochemistry lab. Of the other eight core teachers in the freshman

curriculum, six were DVMs and held advanced degrees (PhDs) in their sciences; two had advanced degrees only. Of these eight core teachers, two had private practice experience.

Eileen had been teaching this particular lab for two years, gradually increasing her use of case studies until they had become the primary instructional method. According to previous course evaluations, students liked the case approach, typically rating the lab as a 9.0 on a 10-point scale. In addition, students indicated that they liked Eileen as a teacher, with average semester ratings between 9.3 - 9.5. Unsolicited comments from students indicated that they liked her relaxed teaching style, personable manner, and sense of humor. The fact that Eileen was a practicing veterinarian seemed to increase both her credibility and approachability. Eileen's perception was that students trusted her to present practical and relevant information; students saw her knowledge as being rooted in practice.

Procedures

Three times during the semester, all 61 students were asked to complete individual written case analyses. After each of these cases, semi-structured interviews were conducted with the 9 selected students to explore their responses to the case method. The first set of interviews was conducted during the third week of the semester. Second and third interviews occurred approximately midway through the semester (week 8) and again at the end of the semester (week 15). Specifically, interviews included questions related to students' perceptions of their interest/enjoyment ("How interesting is this instruction to you?"; "How do you like this type of instruction?"), value ("How valuable is this approach to you?"), and efficacy ("How confident are you learning from this method?").

These 27 interviews constituted our primary data source and were supported by secondary sources in the form of students' written case analyses, classroom observations, teacher case documents, informal teacher interviews, and course evaluations. The use of multiple data sources and methods allowed us to triangulate analysis efforts, thus reducing potential subjectivity. In addition, member checks were secured from the teacher and interviewees throughout the research process.

Data Analysis

To answer our research question of how students responded to case-based instruction, our data analysis began with a search for patterns of responses within each participant's responses (within-case) and then across all learners (cross-case) using a constant comparative method (Glaser & Strauss, 1967). By examining within- and cross-case fluctuations over the semester, we were able to describe students' changing responses.

Thus, the analysis process began with a search for students' positive and negative comments across all interviews and progressed to identifying similarities and differences among comments. For example, as we first began to transcribe interviews, we noted instances where students expressed enjoyment or frustration related to the case method in general or to the specific case they had analyzed. We highlighted the reasons students gave regarding feelings of frustration or enjoyment and constructed tentative matrices that outlined similarities, as well as differences, among students' responses. As we analyzed subsequent interview comments we continued to modify our original matrices—deleting, adjusting, or adding categories of responses to reflect emerging themes.

The example below illustrates our analysis approach. In the first interview, students were asked, "How do you feel about using cases?" We present Ronald's response along with the first author's tentative codings (in parentheses) about the meaning of his response. Ronald's reasons for valuing (or devaluing) the case approach are underlined.

> I enjoy doing them (positive; task value?). They do cause frustration (negative) because right now I really don't know what I'm doing. I don't have a lot of background (external factors; task difficulty; saving face?). I enjoy doing it (positive); it's a change of pace. Right now there's stress (negative) but hopefully that will change with the years (positive) as I become more comfortable with them (not confident now, but expects to improve) and get a wider background. But now they're causing stress (negative) because there's, well, I have no idea what it could possibly be—I only know 2 diseases and that's all (excuses? self-protection?).

Based on this small interview excerpt, we identified a number of possible themes: value due to enjoyment and change of pace; frustration due to a lack of knowledge and an uncertainty of what one was supposed to be doing; poor performance due to task difficulty and lack of background experience; expectation that ability and confidence would improve.

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After completing this level of coding for Ronald's comments, we completed similar codings for the other eight students interviewed. By looking at each student's response to this question, we saw similar, as well as additional or opposing themes. By continuing to look for similarities and differences across students' responses, we gradually clarified and refined our codes to reflect salient themes across individuals, while still noting contrasting features and contextual circumstances surrounding positive and negative responses.

As themes continued to evolve, we began attending to changes in students' responses during the semester. Whereas some students became more frustrated over time, others became more interested and more motivated. By paying close attention to the conditions under which students' responses changed, we noted different patterns of responses among students who remained motivated and those who became frustrated. For example, students began to express more confidence as their focus changed from learning facts to learning the case approach (product vs. process goals). On the other hand, students voiced more frustration as they encountered more difficult cases, as outside pressures mounted, or as the novelty wore off. These critical changes in responses helped us identify conditions related to students' facilitative or limiting responses, taking us past isolated themes and categories to the relationships among them.

Results

In this study we asked questions about how students responded, initially and over time, to case-based instruction. Two general patterns of responses emerged during our analysis and interpretation of the data collected in this study. These patterns revolve around the value that students assigned to case-based instruction and describe the extent to which they felt either challenged or frustrated by the case method. As suggested by motivational research (e.g., Malone & Lepper, 1987), feeling challenged is thought to be a facilitative response whereas feeling frustrated is considered a limiting response. Figure 1 illustrates our conception of how levels of perceived value related to students' responses to case learning in this study. Perceived value, as defined here, includes students' levels of interest in the use of cases in the biochemistry lab course, the perceived relevance of the case method to their current coursework and future career goals, and levels of confidence for both successful performance and ability to learn from this method. Prior to presenting a description of the two general response patterns, we use excerpts from students' interviews to illustrate how each component of perceived value (interest, relevance, and confidence) shaped students' responses to this case-based course in facilitative or limiting ways.

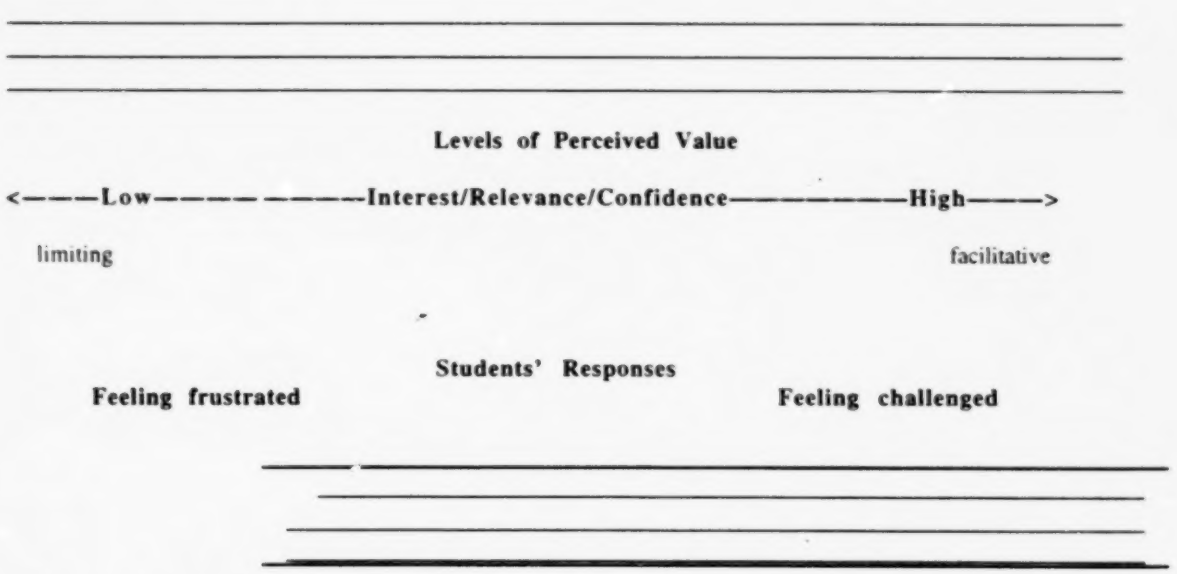

Figure 1. Relationship between levels of perceived value and students' responses to case-based instruction.

Component One—Initial and Changing Interest in Case-Based Instruction

Initial interest. In describing their initial reactions to the use of cases in the biochemistry lab, eight of the nine interviewed students indicated that they thought that cases would make the class more interesting and more fun. In the first interview Winnie explained, "Of course you are more interested in the case because it relates to medicine and to what you want to do later in life. Biochemistry, or physiology, or anatomy is very dry and it's not alive. But working with diseases—it kind of gets you more interested." Mallory indicated, "Biochemistry lab is the most interesting course that we have."

Four students likened cases to a game or puzzle and mentioned the challenging, enjoyable aspects of cases. Mallory stated, "It's more of a challenge; it's like playing a game to see if you can win. It's fun." Six students described how their motivation had increased and one student, Marci, even mentioned how cases had affected her efforts outside of class: "It motivates me to do a lot of extra reading because a lot of stuff you don't get just by going to classes." For the most part, students indicated that case-based instruction was more interesting than their other classes and provided a nice change of pace. Mallory contrasted case-based instruction with her other courses, "I like them (cases). I mean it's not boring. It's not 'memorize these facts and spit them back to me.'" Only Deena qualified her comments stating, "They're good, but only to a certain degree."

Changing interest. By the end of the course, Chrissy, Deena, and Ronald mentioned that casework was becoming tedious and that their motivation had decreased due to other pressures. Chrissy stated, "Sometimes it got to be a really long afternoon when we're going over the same things." Even though these students were "burned out" by the end of the semester, most of their frustration seemed related to outside sources (e.g., other tests, deadlines), rather than to the course. Ronald explained, "Right now things are swamped, end of the year. I'm just burned out I guess." Course evaluations support the conclusion that most students still enjoyed the course at the end of the semester. On a scale from 1-10 the average course rating was 8.9. Unsolicited student comments on the evaluation form included enjoying the case-study approach and having fun in class: "Truly enjoyed labs; they made my others relevant." "I greatly enjoyed lab!!! It was the only class in our curriculum which makes you think logically about cases you will see as a clinician."

Component Two—Initial and Changing Relevance for Case-Based Instruction

Initial relevance. All nine students claimed that cases were "real-life" and had some practical benefits. Chrissy, Deena, and Ronald noted that cases would help them remember more, yet still judged that this would probably not affect other coursework or career goals. Chrissy stated, "I'm planning to be a non-practicing veterinarian so I can't really predict what role, if any, these cases will have." Deena explained, "It's going to help me learn things better, but I don't think I'm going to be remembering these cases when I'm working in the real world." This contrasts with five other students who stated that the case method was very valuable to their future careers, as well as to other coursework. Marci stated, "Cases will definitely help me out in the future. They will help me be a better veterinarian." Not only did these students value the practicality of case-based instruction, but they also noted some global benefits such as learning the problem-solving approach and integrating their knowledge. Sharon stated, "I'm in the situation where I'm trying to pull together everything that I learned in biochemistry as an undergrad and things we're learning in physiology and anatomy and pull everything together through biochem lab. The case studies kind of integrate it and you see where everything connects."

Changing relevance. As the semester went on, there seemed to be a shift regarding which aspect of the case approach was valued most. Students who initially focused on practical benefits (change of pace, ability to remember more facts) began to mention more overarching benefits (application of knowledge, learning the problem-solving approach). The case analysis process, rather than the product, seemed to take on increased relevance. George stated, "I think the biggest thing to me is the whole process of thinking through the different diagnoses. It's just a whole mind set that we're getting into." Ronald mentioned how the case method helped him organize his thoughts and decided, as did Chrissy, that cases could help in applying knowledge learned in other courses.

Component Three—Initial and Changing Confidence for Case-Based Learning

Initial confidence. All of the students expressed some concern about their ability, at this point in their careers, to diagnose the cases they were given. Marci explained, "I was a little intimidated because I knew I didn't have a lot of knowledge to help me figure out what was going on." Chrissy stated, "Right now I'm not terribly confident in my performance." Students used words such as scared, frustrated, nervous, and intimidated. However, everyone but Deena indicated that this lack of knowledge would lead to greater effort. Marci said, "I probably put more effort into understanding what we learn in this class because I know it will definitely be useful."

Changing confidence. As students became more comfortable with the problem-solving approach, as their knowledge base increased, and as their experience with cases increased, they appeared more confident of their case analyses. However, students' confidence seemed primarily related to the amount of prior knowledge and previous experiences they had. Ronald indicated, "If I had a broader repertoire of possibilities, I would have felt more confident." Still, Roslyn and Marci mentioned being motivated by this lack of knowledge. Roslyn remarked, "It's like a kid with a new video game!"

As the semester continued, students seemed to redefine success and to adjust their judgments of confidence to match. They began to emphasize "coming close" rather than naming a specific disease. If diagnoses were "in the ballpark" students judged their work to be successful. Mallory said, "I knew this and this, but being able to list a specific problem, no, I don't know enough diseases to write anything down. But it comes close."

By Time 3, scared and nervous feelings were no longer mentioned, yet Chrissy, Deena, and Ronald expressed frustration due to a lack of knowledge, the specific case, or tediousness of the work. These students were more apt to complain about other responsibilities, other course requirements, and external factors (time and length of lab) that contributed to their stress. Deena explained, "I got frustrated because when I have so many other things to be doing, I don't want to do it." Marci, Sharon, and Winnie also expressed concern about a lack of knowledge, yet tended not to dwell on this. Rather, they reminded themselves of the overall value of casework. Winnie stated, "Although it's frustrating if I get every one of them 'wrong,' I think this is the way to learn." Sharon and Marci both indicated, "We'll be better clinicians because of it."

Summary

Students in this course were observed to respond differently to case-based instruction based on their perceived value for the case method, including their interest in the use of cases, the perceived relevance of cases to their current and future work, as well as their perceived confidence for learning from this approach. Furthermore, these responses appeared to vary as interest, relevance, and confidence levels changed. Although all of the students interviewed in this study found the case method interesting and valuable at the start of the semester, value "levels" were not equivalent across students. Whereas some students simply stated that cases were enjoyable and a nice change of pace, others described important connections to their other coursework or career goals, as well as to their overall motivation and confidence for learning.

As indicated earlier, students' perceived value changed during the semester, both by level and by type. That is to say, some students changed in terms of the amount of value they assigned to case learning (with some assigning more, others assigning less) as the semester progressed; some changed their reasons for valuing the method, for example from a focus on the enjoyment aspects to one on perceived relevance to future career goals. These varying levels and types of perceived value appeared pervasive in influencing students' initial and subsequent responses to case-based instruction. For example, students who initially placed high value on the integrative and linking functions of cases (e.g., Marci, Sharon, Winnie) appeared to maintain a high value for the case method throughout the semester. Students who changed their emphases from practical and immediate benefits to more long-term benefits (e.g., George, Mallory, Roslyn) appeared to increase in perceived value for the case method. Still, a few students (e.g., Chrissy, Deena, Ronald) who initially valued cases because they were interesting and "not too hard," decreased in perceived value as the novelty wore off and cases became more difficult.

In general, students who valued the case method as a useful learning tool tended to emphasize learning the case analysis process and directed their efforts toward mastering the analysis approach. These students seemed to prefer tasks which were new, challenging, or difficult so "they could learn from them." Students who did not perceive the relevance of the method to their current or future work, and/or who lost interest in the method seemed more interested in learning specific biochemical facts and did not seem to enjoy the challenge provided by new and/or difficult cases. Wigfield (1994) suggested that when learners are engaged in tasks for utilitarian purposes (e.g., to complete a task, to get a grade) they may not wish to be as challenged as those who hold high value for the task. If a task is too challenging, such learners may begin to look for other tasks that could meet their utilitarian needs in less challenging ways.

In summary, students who described case-based instruction as being relevant to their current and future work, who expressed high interest in and enjoyment of the case teaching method, and who were confident that they could learn relevant skills and information in this manner, appeared motivationally challenged by the case method. In contrast, students who expressed concern that they might not learn all the biochemical facts they needed to know, who were not convinced of the relevance of these cases to their other work, and who were unsure of their ability to perform successfully, felt frustrated by this approach.

Discussion

The results of this exploratory study point to the potential role that perceived value (as defined by levels of interest, relevance, and confidence) may play in shaping students' responses in a case-based course. Although our results must be regarded as tentative, given the small number of participants, they suggest important areas for future research. Perceived value, as a motivational component of learning, has been described in the literature as influencing one's willingness to learn. Wigfield (1994) suggested that learners' "valuing of different tasks may be an important precursor of their willingness to devote time and energy needed to become proficient at that task" (p. 121).

Although there are many who may agree with Wassermann's (1994) claim that "case method teaching can be effectively applied in virtually every subject area, at most educational levels" (p. 11), case-based instruction was not equally beneficial/meaningful for all learners in this study. By examining the responses of a variety of learners, we identified aspects of case-based instruction that were most valuable and most frustrating for this group of learners. These results provide important insights regarding how to design and structure case-based learning environments so as to increase students' valuing of both the case analysis approach and specific case analysis tasks.

Based on comments from these nine students, we suggest specific aspects of the case method that might be re-designed to optimize student learning. For example, when instructors are preparing to implement a case approach, they might begin by considering the following questions: Do students understand what they are supposed to do and why they are doing it? Do students perceive the relevance/meaningfulness of the cases/case method outside of the classroom setting? Are the cases perceived as being authentic and realistic? Are they interesting and enjoyable? Is there enough variety to keep interest and motivation high? Do students believe that they can master the case approach with a reasonable amount of effort? Are there opportunities to learn from mistakes and to learn from and with others? Are students involved in the design and selection of tasks? Are students permitted/ encouraged to make choices regarding how they learn? By designing case-based learning environments with these questions/concerns in mind, students may be better able to see the value which many educators believe is inherent in the method. Furthermore, it is expected that by increasing students' value for the case method, effective learning will be more likely to occur (Brown & DeLoache, 1978).

Limitations and Directions for Future Research

In addition to the small number of participants, several components of this study limit its comparability. First, this study described students' responses to one variation of the "case method." Students' responses might be expected to vary with the specific type of case/case method used. It would be useful to examine how differences in case design and purpose influence students' responses. Second, veterinary students may not be representative of students in other disciplines that use case methods. It would be important to examine the responses of students in a variety of disciplines. Third, in this study we observed one instructor's use of case studies in one content area and thus cannot separate specific effects due to the instructor from those due to the method, content, or participants. Perhaps if this instructor used a traditional method, students would still have responded as they did. Or perhaps, this group of students would have responded similarly to this and/or other instructional methods regardless of the teacher. Comparisons among students' responses to different instructors and different methods used by the same instructor might clarify this picture.

Conclusion

This study examined students' responses to case-based instruction by exploring the similarities and differences among nine students' experiences. Understanding how case-based learning is experienced by the participants requires in-depth interviews with a variety of students to gain their unique perspectives. It is our hope that, having heard the voices of these nine learners as they encountered the challenges and difficulties of an unfamiliar and demanding educational approach, educators will be in a better position to help future students effectively respond to similar demands.

One important implication of this study is the need to inquire into students' value for the educational tasks and methods they encounter. The fact that students responded differently to the same instructional method highlights the importance of attending to individual students' perceptions of, and responses to, classroom experiences. Although case-based instruction was highly motivational and engaging for some, it was a difficult and frustrating learning experience for others. Rather than assume that case-based instruction automatically works for all learners, it is important for educators to assess their students' initial perceptions and skill levels and then modify or enhance the case approach to meet their needs. By being aware of the effects that perceived value may have on students' responses, educators may be able to alter or eliminate potential difficulties before they become problematic. As Daloz (1990) reminds us, "Understanding the precise nature of the demands we make on our students and calibrating our expectations to their particular strengths and weaknesses is a special art" (p. 89) yet this is, after all, what all good teachers are expected to do.

It is hoped that the results of this study will help case designers and case teachers meet the challenge of supporting students in their efforts to become effective case learners.

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